

Also, the present invention includes suitable control and circuitry means (not shown). Said control and circuitry means are hereby incorporated into the present invention. The curvilinear V-shaped grooves of both movable picker assembly 32 and storage magazine 37 conform to the diameter of the discs to be stored and transported.

In FIG. 2, a travel path 10 of disc 33 is shown. An edge 14 of disc 33 is in contact with an edge 13 of picker wheel 34. To remove disc 33 that is stored in storage magazine 37, picker wheel 34 is brought into contact with edge 14 of disc 33 (explained below in FIG. 3), picker wheel 34 rotates in a clockwise fashion, disc 33 is then caused to travel from curvilinear V-shaped groove storage slots 9 in storage magazine 37 to curvilinear V-shaped groove (not shown) of movable picker assembly 32. To return disc 33 to storage magazine 37, picker wheel 34 is brought into contact with edge 14 of disc 33, picker wheel 34 then rotates in a counter-clockwise fashion, thereby causing disc 33 to travel along curvilinear V-shaped groove (not shown) of movable picker assembly 32 until it is returned to curvilinear V-shaped groove storage slot 9 in storage magazine 37. The radius of curvilinear V-shaped groove storage slots 9 and curvilinear V-shaped groove (not shown) of movable picker assembly 32 corresponds to the radius of disc 33, while travel path 10 corresponds approximately to the diameter of disc 33.

FIG. 3 shows a sectional plan view of picker arm 19 and storage magazine 37 taken generally along line 3—3 of FIG. 1 looking downwardly through movable picker assembly 32. A picker lever actuation means 40 acts on one end 12 of a picker lever 46 (shown in greater detail in FIG. 4) to rotate picker lever 46 and cause picker wheel 34 to engage edge 14 of disc 33. Picker lever actuation means 40 can be any actuation means known to the art that will not change state, i.e., will not allow picker lever 46 to disengage unless commanded to do so, thereby preventing a disc from being dropped should power be interrupted during disc transfer. A first picker lever spring 41A ensures that there is sufficient contact pressure by picker wheel 34 against edge 14 of disc 33. A second picker lever spring 41B assists the motion of picker lever 46, if necessary, when it is disengaged from its contact with edge 14 of disc 33 by picker lever actuation means 40. A drive belt 43 is wound about a first picker lever pulley 42 and about a second picker lever pulley 44. Guide rollers 38A and 38B are shown in contact with support and guide brace 36. A bias spring 39 maintains sufficient contact pressure between guide roller 38A and support and guide brace 36.

FIG. 4 shows a cross-sectional view of picker lever assembly 32 taken generally along line 4—4 of FIG. 3. Picker lever 46 moves about a drive shaft 18. A drive belt 43 is wound about first picker lever pulley 42 located at the top of drive shaft 18 and about second picker lever pulley 44 located below picker wheel 34 that is mounted on second picker lever pulley 44. Second picker lever pulley 44 rotates on shaft 17, said shaft 17 being seated in picker lever 46 itself. Drive shaft 18 is located through movable picker assembly 32 and is coupled to one end of a drive gear 47. Drive gear 47 is connected to a picker wheel motor 48. Drive shaft 18 rotates easily due to the presence of ball bearings 45 oriented about shaft 18 in a friction-reducing manner.

Picker wheel motor 48 causes drive gear 47 to rotate drive shaft 18 thereby rotating first picker lever pulley 42. First picker lever pulley 42 rotates belt 43 which in

turn rotates second picker lever pulley 44, thereby rotating picker wheel 34.

FIG. 5 shows a partial plan perspective similar to FIG. 1. Cable 28 is shown attached to tension spring 11.

FIGS. 6 and 7 show a vertical sectional view and a plan view, respectively, taken generally along line 6—6 of FIG. 5. Guide rollers 26A, 26B, 26C, and 26D are shown oriented about elevator guide rod 30. In one embodiment, guide rollers 26A and 26B are seated in movable picker assembly 32, while guide rollers 26C and 26D are seated in roller support block 31. This provides for adjustment of the orientation of movable picker assembly 32. Guide rollers 26A—26D are spaced ninety degrees apart and act to evenly bias movable picker assembly 32 about elevator guide rod 30 thereby providing a means to support movable picker assembly 32 and allowing for the smooth and exacting vertical movement of movable picker assembly 32 along elevator guide rod 30.

FIG. 8 is a detailed sectional view taken generally along line 8—8 of FIG. 5 showing guide rollers 38A and 38B oriented about support and guide brace 36. Guide rollers 38A and 38B are seated in picker arm 19. Bias spring 39 ensures sufficient pressure contact between guide roller 38A and support and guide brace 36. Guide rollers 38A and 38B act to evenly bias picker arm 19 about support and guide brace 36 thereby allowing for the smooth and exacting vertical movement of picker arm 19 along support and guide brace 36.

FIG. 9 shows an alternative embodiment of the present invention. A worm drive motor 53, seated on an alternative support 60, actuates a first worm gear 54 which in turn rotates a second worm gear 55 which is located at one end of a worm drive shaft 52. Worm drive shaft 52 interfaces with an alternative movable picker assembly 58 via two threaded flanges 56A and 56B and is seated in an alternative base or chassis 59 via a bearing 57. Worm drive shaft 52 easily rotates within bearing 57. Two guide rollers, 51A and 51B, are supported by an alternative roller support block 61 of movable picker assembly 58 and are oriented about an alternative elevator guide rod 70. Guide rollers 56A and 56B act to evenly bias movable picker assembly 58 about elevator guide rod 70 thereby providing a means for supporting movable picker assembly 58 and allowing for the smooth and exacting vertical movement of movable picker assembly 58 along elevator guide rod 70. Guide rollers 51A and 51B would preferably have a bias spring similar to bias spring 39.

In this embodiment, worm drive motor 53 rotates worm drive shaft 52 causing movable picker assembly 58 to travel vertically along elevator guide rod 70. The force required to lift and lower movable picker assembly 58 is generated at the interface of worm drive shaft 52 and threaded flanges 56A and 56B. As worm drive shaft 52 rotates, threaded flanges 56A and 56B translate the rotational force into vertical movement of movable picker assembly 58.

FIG. 10 shows a cross-sectional view taken generally along line 10—10 of FIG. 9 showing guide rollers 51A and 51B and threaded flanges 56A and 56B. In one embodiment, threaded flanges 56A and 56B are in a stacked orientation, i.e., half flanges, one above the other, on opposite sides of worm drive shaft 52. The threaded surfaces of threaded flanges 56A and 56B are preferably oriented on a line emanating from a center of gravity of movable picker assembly 58. Other embodi-